SEPTEMBER 1978
No. 9

FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / NATIONAL MARINE FISHERIES SERVICE

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE - P. O. BOX 271
LA JOLLA, CALIFORNIA 92037

FISHING INFORMATION

SEPTEMBER 1978, No. 9

EDITOR: JAMES A. RENNER

I. Barrett, Director, SOUTHWEST FISHERIES CENTER
J. Carr, Deputy Director

PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) charts of winds and pressures for the eastern North Pacific, 4) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 5) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. It contains a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

To cancel delivery of this publication in the event you no longer need to receive it, or to change the delivery address if you are moving but still need to receive it, please notify us by writing: James A. Renner, Editor, Fishing Information, National Marine Fisheries Service, Southwest Fisheries Center, P. O. Box 271, La Jolla, California 92038.

Submitted for publication - October 31, 1978

CONTENTS

Page

Acknowledgements iv

Sea Surface Temperature and Environmental Conditions - September 1978, Forrest R. Miller. . . 1

ENVIRONMENTAL CHARTS, PACIFIC OCEAN - September 1978

Figure 1. Eighteen-year mean (1961-1978) observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction 4

Figure 2. Observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction 5

Figure 3. Mean sea surface temperature, eastern North Pacific Ocean. Square shows temperatures at weathership station. Numerals on shore are temperatures at coastal and lightship stations 6

Figure 4. Mean sea surface temperature chart, western North Pacific Ocean 7

Figure 5. Deviation of sea surface temperatures, eastern North Pacific Ocean from 20-year mean (1948-1967). Hatched areas are colder in 1978 8

Figure 6. Deviation of sea surface temperatures, western North Pacific Ocean from 20-year mean (1948-1967). Hatched areas are colder in 1978 9

Figure 7. Deviation of sea surface temperatures, eastern North Pacific Ocean from those of September 1977. Hatched areas are colder in 1978 10

Figure 8. Mean sea surface temperatures, eastern tropical Pacific Ocean 11

Figure 9. Deviation of sea surface temperatures, eastern tropical Pacific Ocean from 20-year mean (1948-1967). Shaded areas are colder in 1978. Contours are dashed in sparse data areas 12

Figure 10. Surface temperature and salinity and subsurface temperature structure from expendable bathythermograph observations between Honolulu and San Francisco August 22-28, 1978 13

ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, and 15 day supplement)

TECHNICAL EDITOR:
K. Raymond
CARTOGRAPHY:
E. Portillo

Acknowledgements

The following organizations and stations contributed data for September 1978 charts:

Inter-American Tropical Tuna Commission, La Jolla, California
Kelco Company, San Diego, California
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, La Jolla, California; Honolulu, Hawaii
National Weather Service, San Diego, California and Washington D. C.
National Ocean Survey, Pacific Marine Center, Seattle, Washington

Fisheries Research Board of Canada, Pacific Environment Institute, West Vancouver, British Columbia by L. F. Giovando from observations by:
J. Redhead at Langara Island Light; D. Veale at Cape. St. James Light;
L. Collins at Kains Island Light; M. V. Stewart at
Amphitrite Point Light

Scripps Institution of Oceanography, La Jolla, California

Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Chevron Mississippi* of the Chevron Shipping Co., Ltd. The data are processed under supervision of D. R. McLain at the NMFS Pacific Environmental Group, Monterey, California, using computer facilities of the Fleet Numerical Weather Central, Monterey. The project is partially supported by the National Science Foundation and the Office of Naval Research.

Sea Surface Temperature and Environmental Conditions

Forrest R. Miller

Eastern North Pacific

During September surface pressures normally decrease in the Gulf of Alaska as the Aleutian low pressure system intensifies (Figure 1). The subtropical high pressure center normally shifts eastward to near 37°N, 142°W and a weak high pressure ridge extends from the center northeastward over Oregon and Washington. Sea surface temperatures (SST) normally continue to increase through September over a large region extending 600 to 700 miles out from the high pressure center.

During September 1978 the Aleutian low was centered in the Gulf of Alaska near 57°N, 142°W (Figure 2). Along the southern and eastern periphery of the Aleutian low, surface pressures were 4 to 6 millibars below normal and south of the Aleutian Islands to 35°N they were 2 to 4 millibars above normal. This was due to a westward shift of the sub-tropical high pressure center with an average location near 37°N, 160°W. Frequent weather fronts accompanied by heavy cloud cover and stronger than normal surface winds moved eastward between 40°N and 50°N across the north Pacific. Most of the late summer storms intensified in the Aleutian low and became strong systems as they approached the coasts of British Columbia, Washington and Oregon. The storm passages, followed by high pressure centers over the U. S. northwest, caused persistent higher than normal surface winds from Cape Blanco to San Francisco Bay. As a result, coastal fishing activity was often adversely effected by the high winds and rough seas. South of 35°N surface pressures, winds and sea state conditions were near normal.

Along the U. S. west coast from 35°N to 42°N, SST's were 13 to 15°C (Figure 3) in areas where coastal upwelling and wind mixing were dominant. Fairly strong ocean fronts developed along western edges of the cooler coastal water which were 1 to 2°C below normal from Monterey Bay to Cape Arguello. In September there was considerable tuna fishing activity along and west of coastal areas where ocean frontal boundaries were strongest. Off the coast of Washington and Oregon between 125°W and 132°W and from 41°N to 48°N, SST's were more than 1°C below normal (Figure 5). Two other areas of negative departures developed in the Gulf of Alaska. These areas were in zones of heavy wind mixing during frequent storm passages. One small area of positive SST departures was centered near 45°N, 135°W which may have been associated with advection of warmer water from the south and ahead of storms that intensified in the Aleutian low. The pattern of negative departures from normal (Figure 5) east of 155°W was similar to the patterns of SST difference between Septembers of 1977 and 1978 (Figure 7), except south of 25°N. From 40°N to 45°N the north Pacific ocean front, as represented by close north-south packing of SST contours, was not unusually strong for September, except in the areas west of 160°W where adjacent SST negative and positive departures were greater than 1°C (Figure 5). The more westerly position of the subtropical high pressure system in September probably led to a greater than normal movement of surface water from south to north, west of 160°W. A large area of positive SST difference from September 1977 appeared south of the North Pacific front and west of 160°W (Figure 7). North or 45°N, SST's were 1 to 2°C colder in 1978 than in 1977. Another area with positive SST departures from normal, which was similar to the pattern in August 1978, extended from 20°N to 35°N between 120°W and 135°W. The movement of several tropical storms to the northwest along Baja California and west of 130°W during August and September helped to reenforce the above normal SST's between the storm tracks.

Western North Pacific

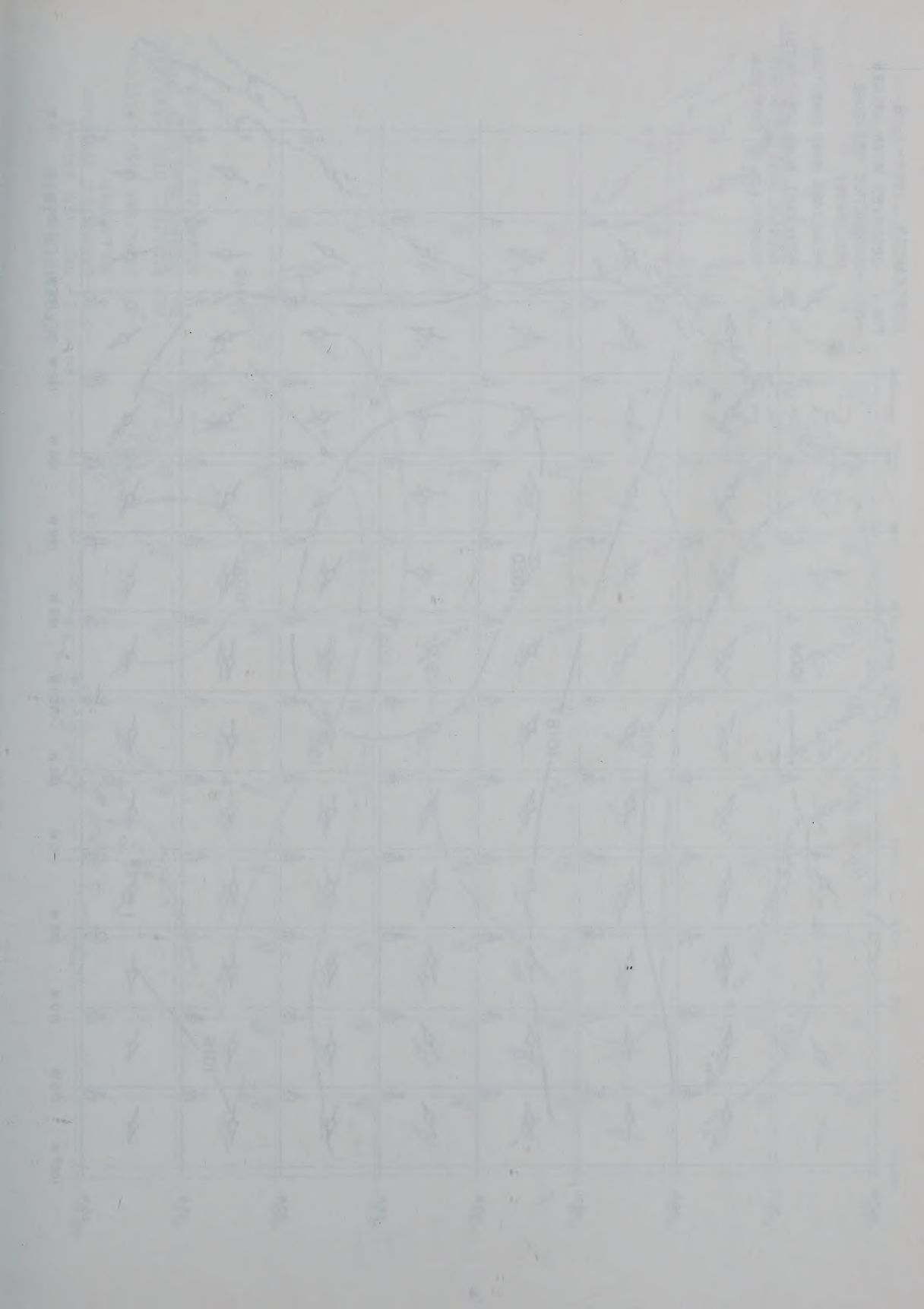
During September the western Pacific high pressure system was not a dominant feature, particularly west of 160°E. Several low pressure systems moved northward between 140°E and and 160°E. Some lows were of tropical origin and others developed near 40°N along the southern boundary of the north Pacific ocean front. The ocean front was most pronounced east of northern Japan and between 160°E and 180° where the north-south SST gradients were greatest (Figure 4). In these regions several small areas of positive SST departures from normal were concentrated between 40°N and 45°N adjacent to other small areas of negative SST departures (Figure 6). The area of negative departures south of Japan and extending northward along the east coast of Japan was caused, in part, by several tropical storms which developed in the tropics and moved toward Japan in August. In August the extensive high winds around the tropical storms caused wind mixing which reduced SST's 1 to 2°C over several large areas south of Japan. However, in September the tropical storm activity was less than in August and SST's along the storm tracks south and east of Japan had returned to near normal.

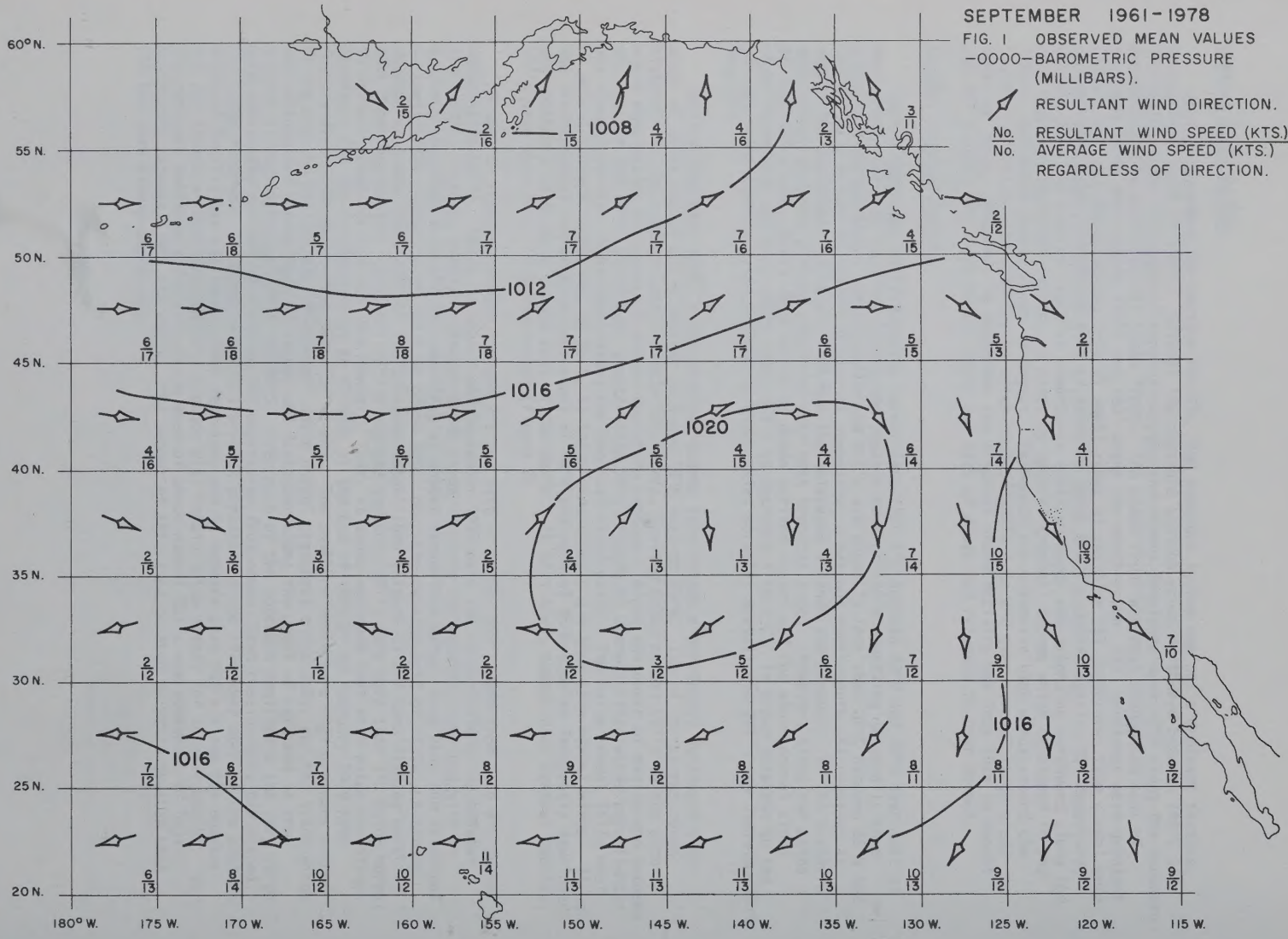
Eastern Tropical Pacific

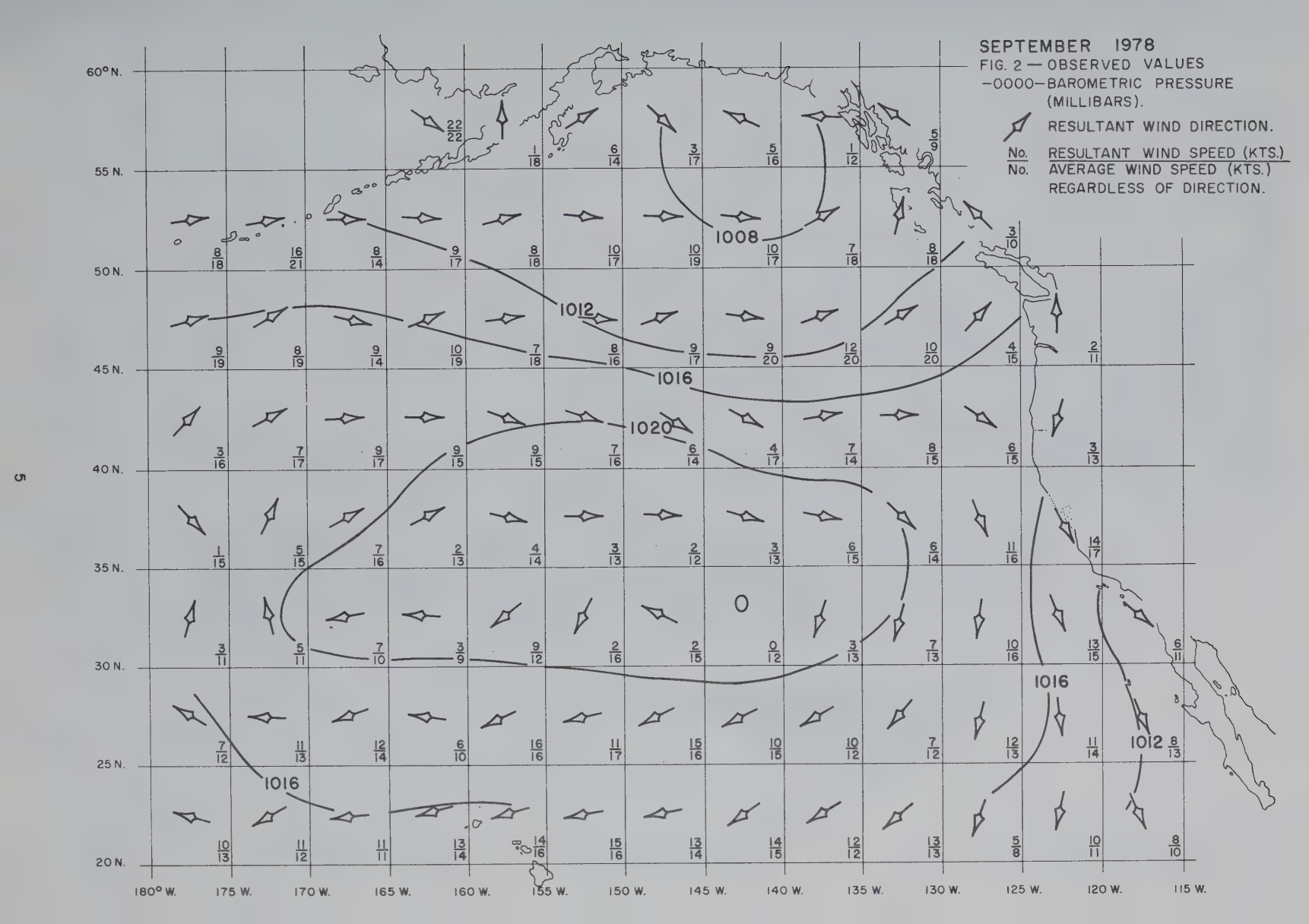
During September SST's normally change less than 1°C between 30°N and 30°S over most of the eastern tropical Pacific. Along the equator east of 140°W upwelling is usually more pronounced during August and September and SST's are normally less than 22°C between 85°W and 120°W. As a result of strong equatorial upwelling, a maximum north-south SST gradient is normal for September, especially between the Galapagos Islands and Ecuador. In the northern hemisphere, seasonal warming continues over most tropical areas. However, along the paths of tropical storms, heavy wind mixing of ocean surface layers and the above normal cloud cover around the storms usually cause SST's to decrease 1 to 2°C. In areas adjacent to the storms, light surface winds and fairly clear skies normally prevail and SST's may increase more than 1°C.

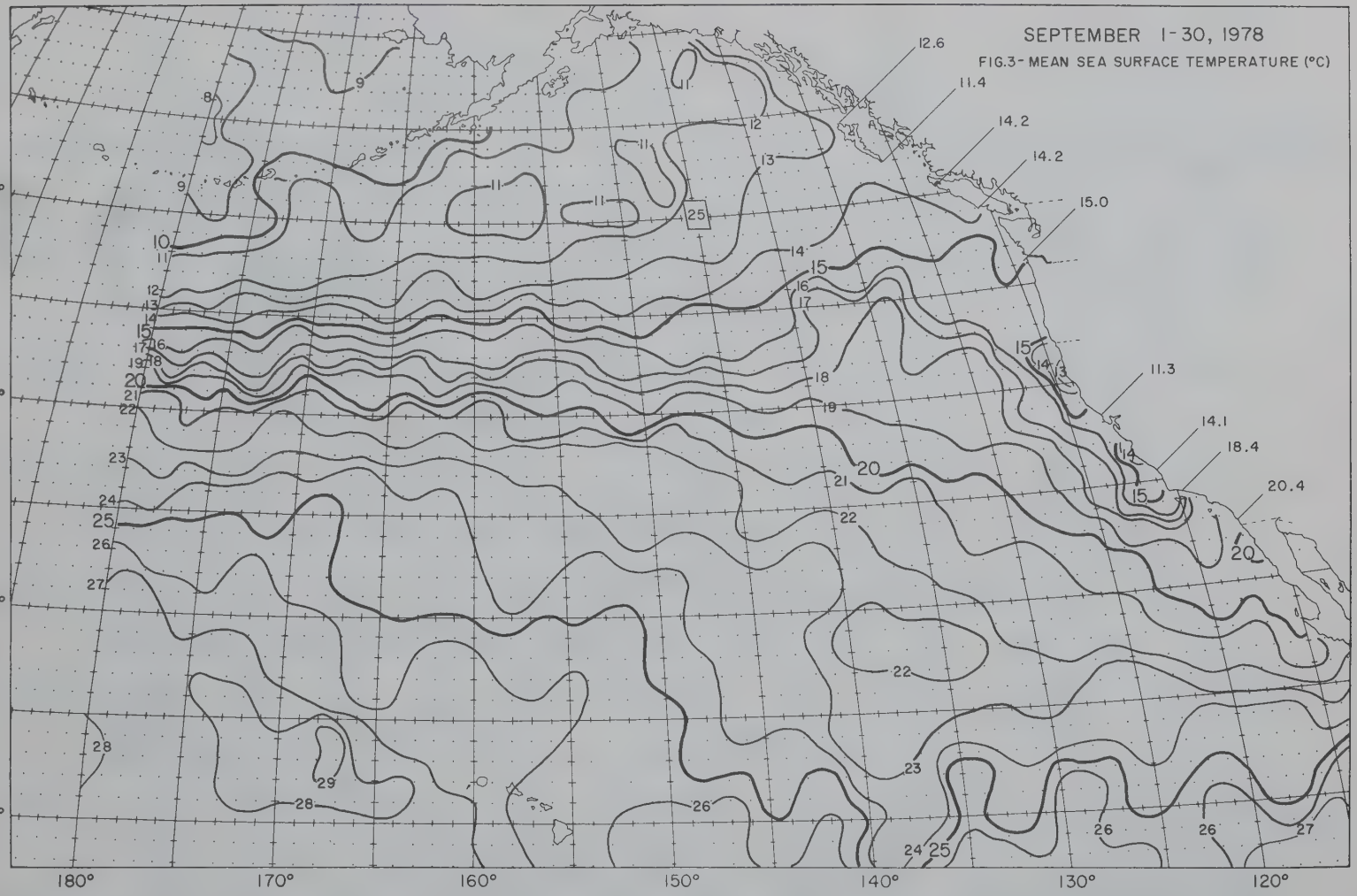
During September 1978, three tropical storms (one became a hurricane) developed over areas of above normal SST's between 10°N and 15°N west of 95°W. Two of the storms moved northwest to the southern part of Baja California, leaving below normal SST's in the path where wind mixing was greatest around the storm centers. Along the coast of Mexico and between the equator and 10°N, SST's were greater than 28°C (Figure 8) where surface winds were lighter and cloud cover less than those along the tropical storm paths. The below normal SST's west of Baja (Figure 9) were due, in part, to storm conditions and higher than normal winds. Along the intertropical convergence zone south of 10°N and east of 95°W squalls frequently developed and southerly winds were strong most of the month. In this area, except near Central America, SST's were more than 1°C below normal (Figure 9).

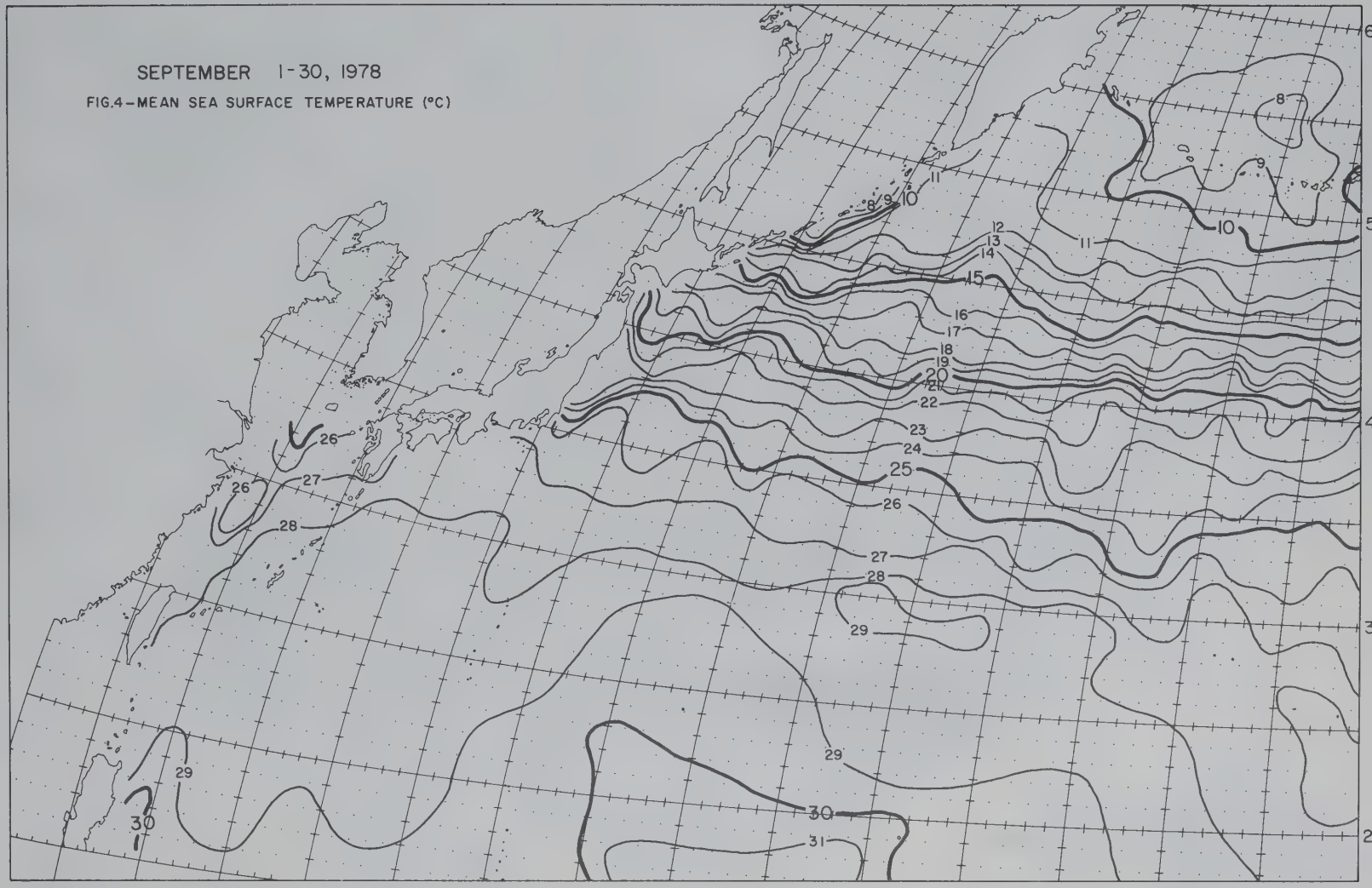
Along the equator between 3°N and 3°S and east of 130°W, SST's were from 1 to 3°C below normal (Figure 9). SST's in August and September 1978 were the coldest along the equator since 1974. Strong, steady southeast trade winds crossing the equator, combined with an apparent increase in equatorial upwelling of colder subsurface water, have been the principal factors in the reduction of SST's to below 22°C near the equator east of 120°W. A strong equatorial ocean front east of 110°W became established (Figure 8) and tuna fishing north of this front was active. West of 130°W along the equator, SST's were more than 1°C below normal in several areas for the past two months. Thus, it seems apparent that warm water conditions necessary for the development of an El Nino at the end of 1978 or by February 1979 have rapidly diminished during the past few months. The southern hemisphere high pressure system in the eastern Pacific has maintained above normal pressures since July, and the trade winds were strong and steady most of August and September along the coast of Peru and in the equatorial region between 10°N and 10°S. Over much of the southern hemisphere the very large area previously covered by positive SST departures from normal have considerably diminished. The large reservoir of above normal SST's which persisted since 1974 over much of the eastern tropical Pacific has apparently been depleted, and it appears that SST's along the equator and the coasts of Peru and southern Ecuador will remain below normal for several months. In the northern hemisphere the only large area of above normal SST's was southwest of Baja California between 120°W and 140°W. The amount of this area covered by SST's greater than 1°C has been slowly decreasing.

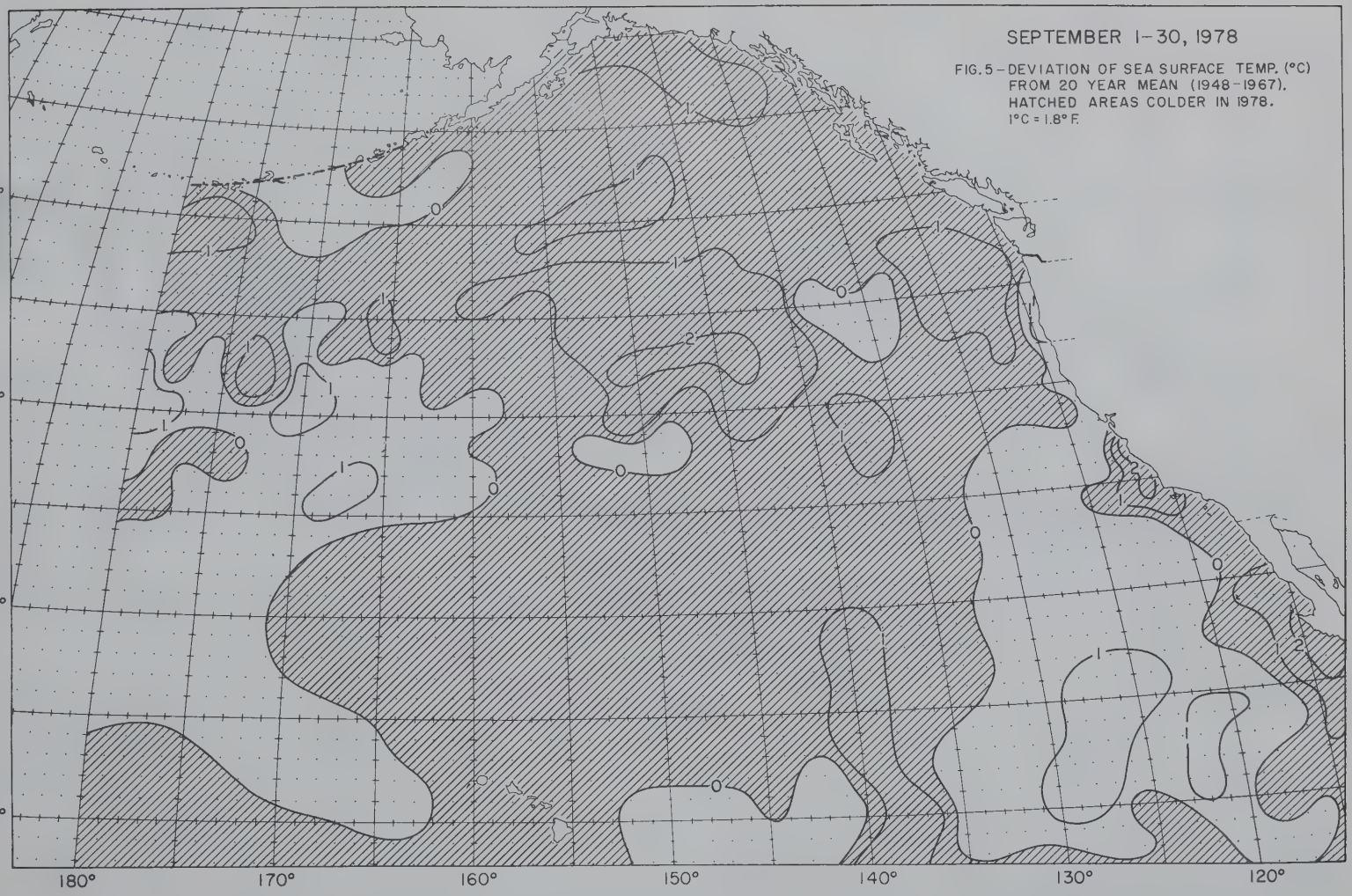


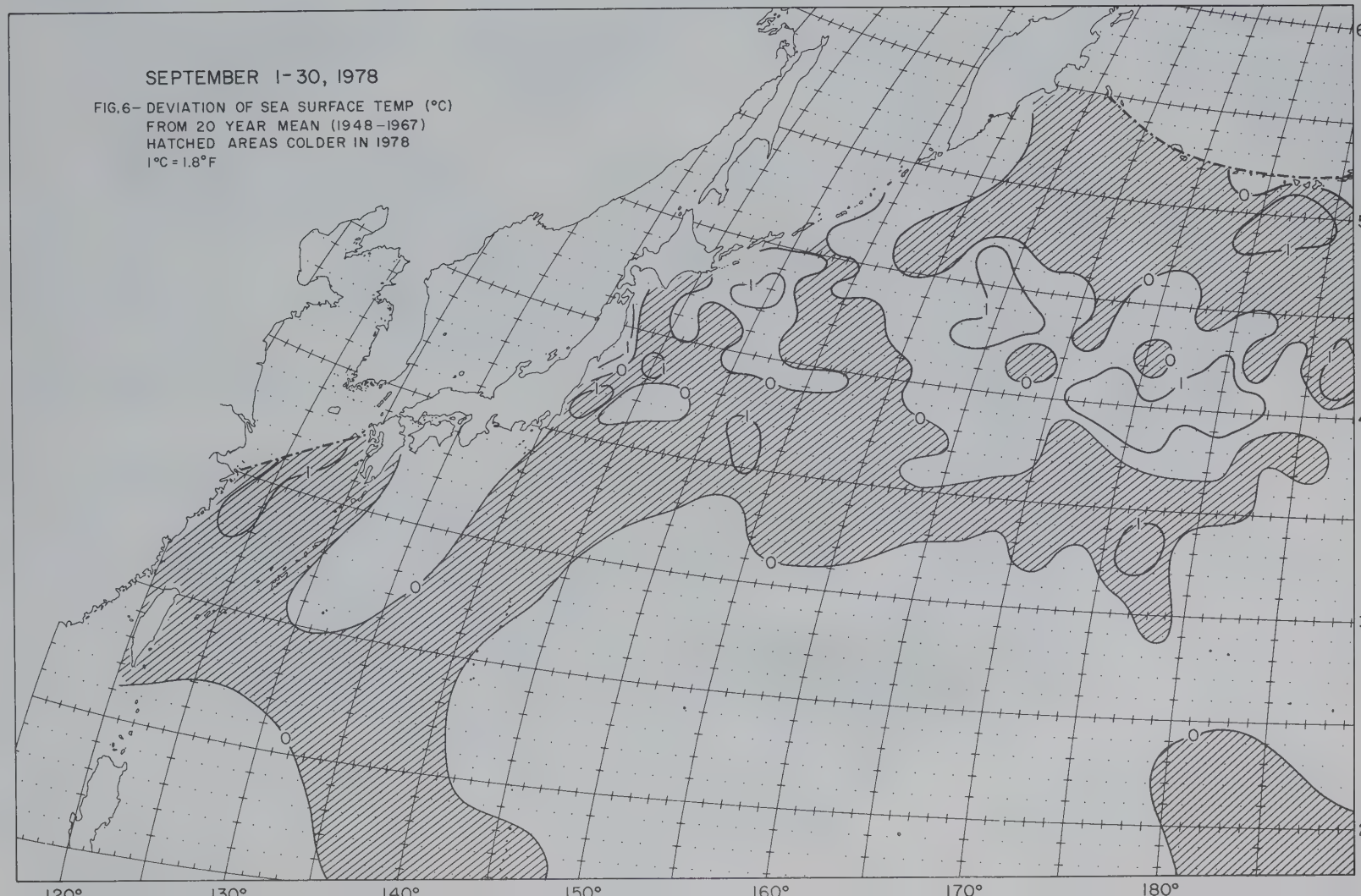

SEPTEMBER 1961-1978
FIG. 1 OBSERVED MEAN VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1008
1012
1016
1020
1016
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

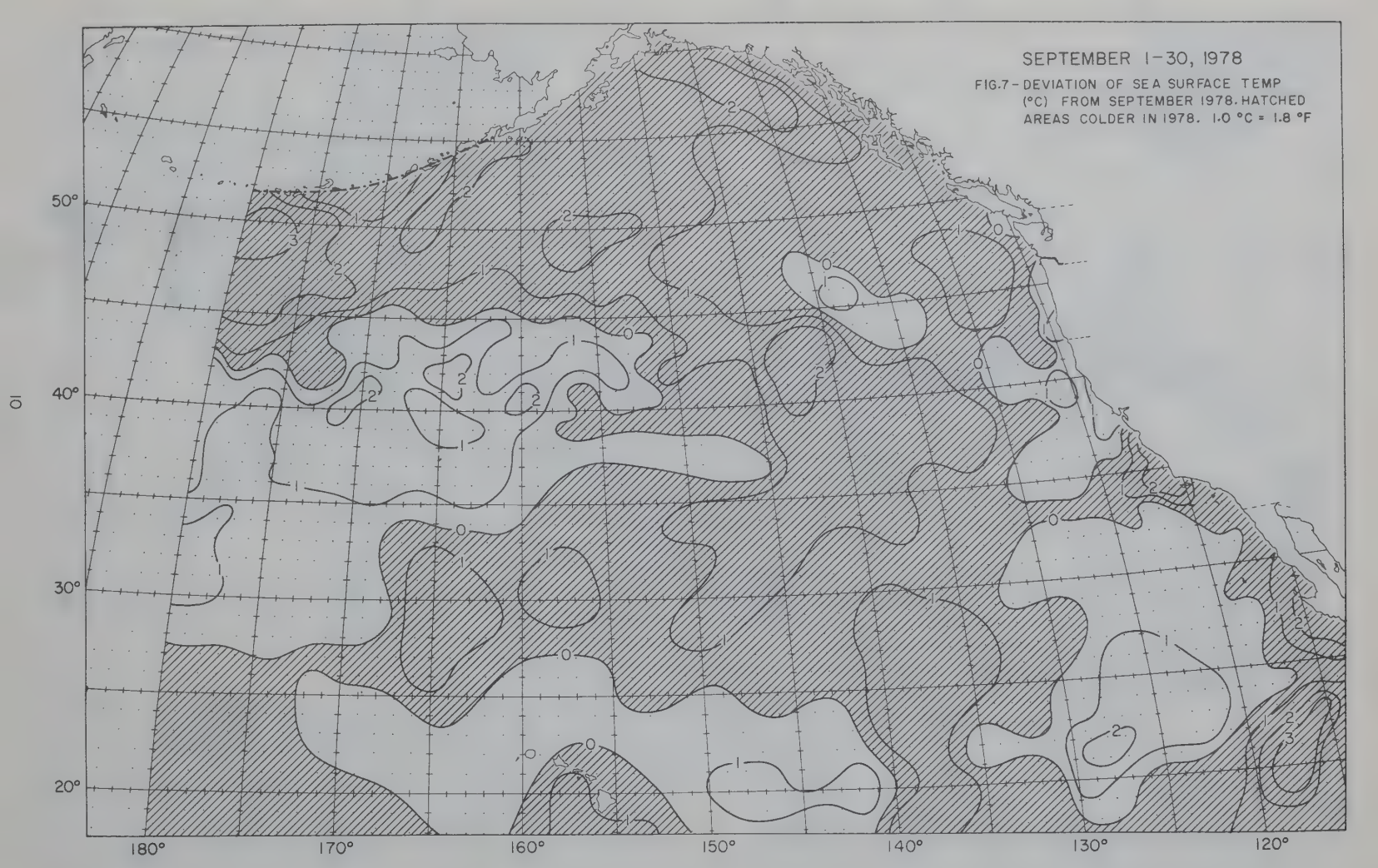

SEPTEMBER 1978
FIG. 2 — OBSERVED VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1008
1012
1016
1020
1016
1012
1016
0
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

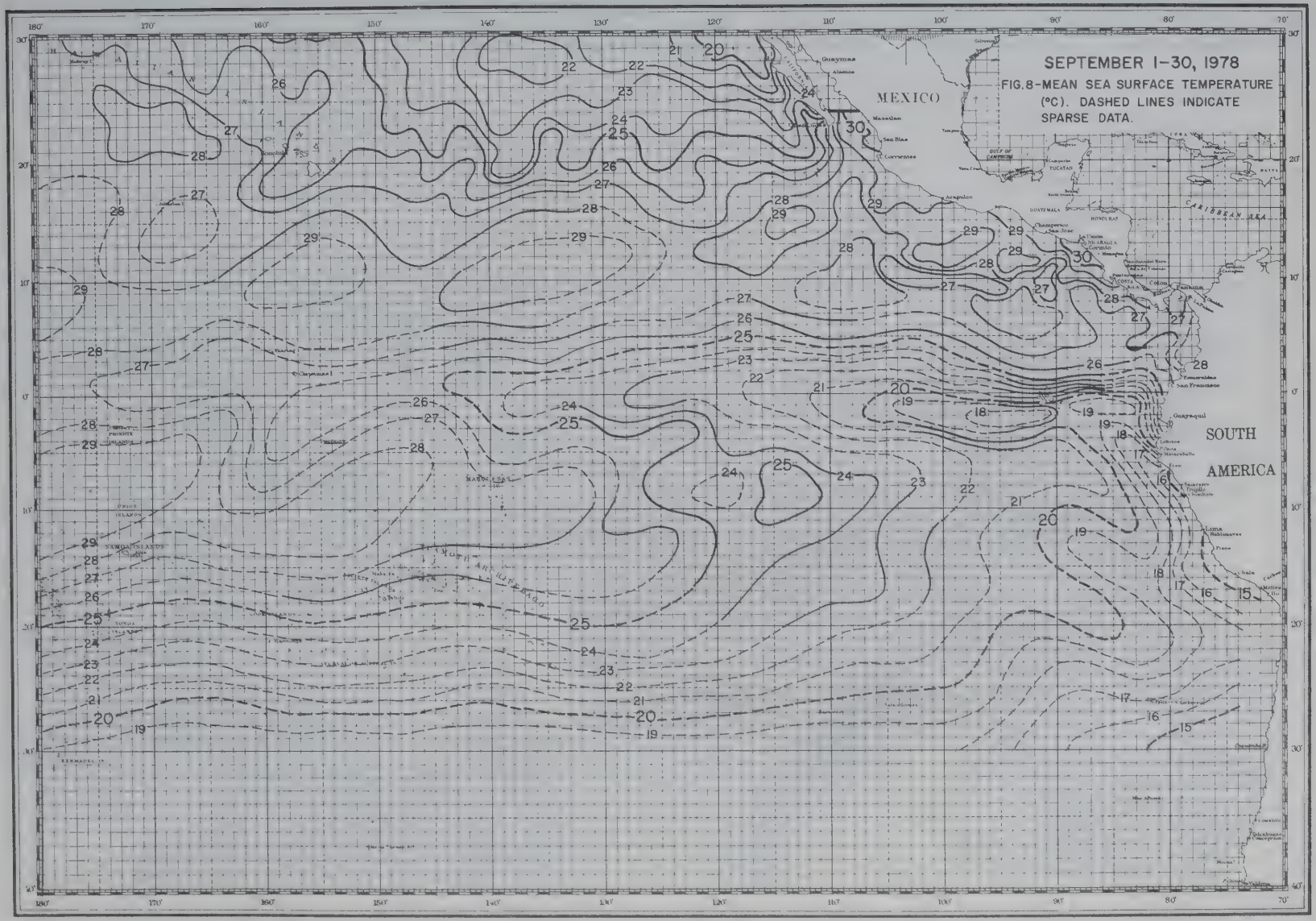

SEPTEMBER 1-30, 1978
FIG.3- MEAN SEA SURFACE TEMPERATURE (°C)
12.6
11.4
14.2
14.2
15.0
11.3
14.1
18.4
20.4
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


SEPTEMBER 1-30, 1978
FIG.4-MEAN SEA SURFACE TEMPERATURE (°C)
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


SEPTEMBER 1–30, 1978
FIG. 5 – DEVIATION OF SEA SURFACE TEMP. (°C) FROM 20 YEAR MEAN (1948–1967). HATCHED AREAS COLDER IN 1978.
1°C = 1.8° F.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


SEPTEMBER 1-30, 1978
FIG. 6- DEVIATION OF SEA SURFACE TEMP (°C)
FROM 20 YEAR MEAN (1948-1967)
HATCHED AREAS COLDER IN 1978
1°C = 1.8°F
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


SEPTEMBER 1-30, 1978
FIG.7 - DEVIATION OF SEA SURFACE TEMP (°C) FROM SEPTEMBER 1978. HATCHED AREAS COLDER IN 1978. 1.0 °C = 1.8 °F
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


SEPTEMBER 1-30, 1978
FIG.8-MEAN SEA SURFACE TEMPERATURE (°C). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
Guaymas
Acapulco
Guayaquil
Lima
San Francisco
Galapagos Is.
Marquesas Is.
Tuamotu Archipelago
Society Is.
Samoa Islands
Tonga
Fiji Is.
Bermuda
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
10°
20°
30°
40°

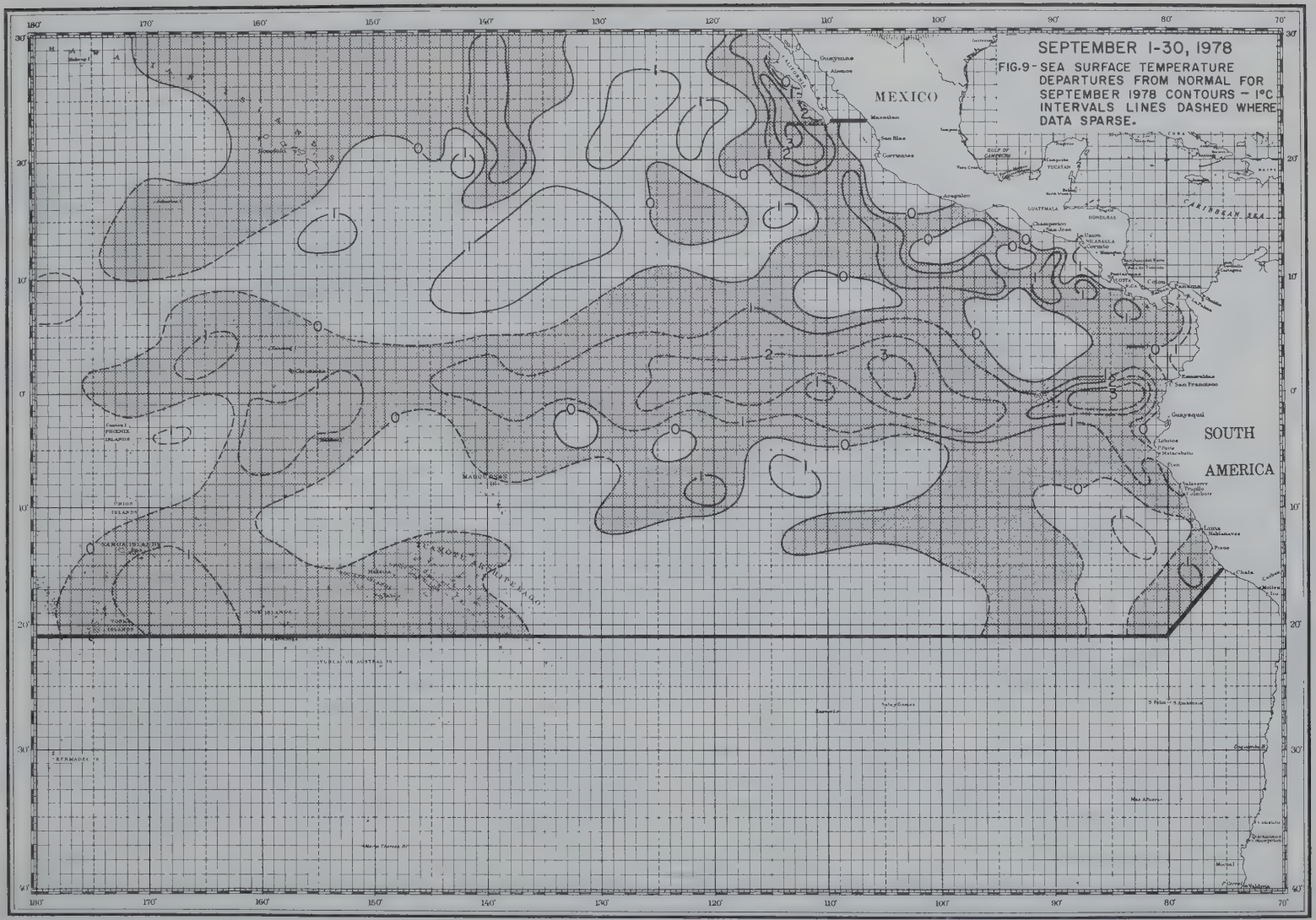
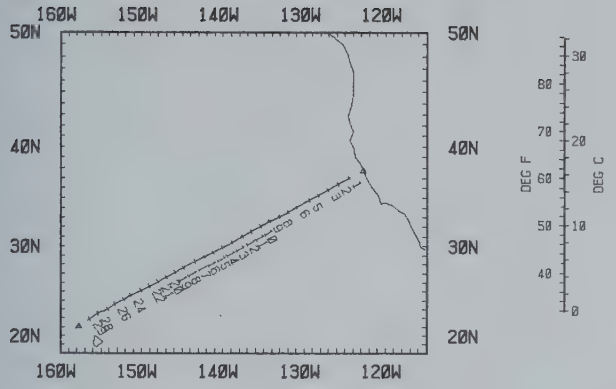
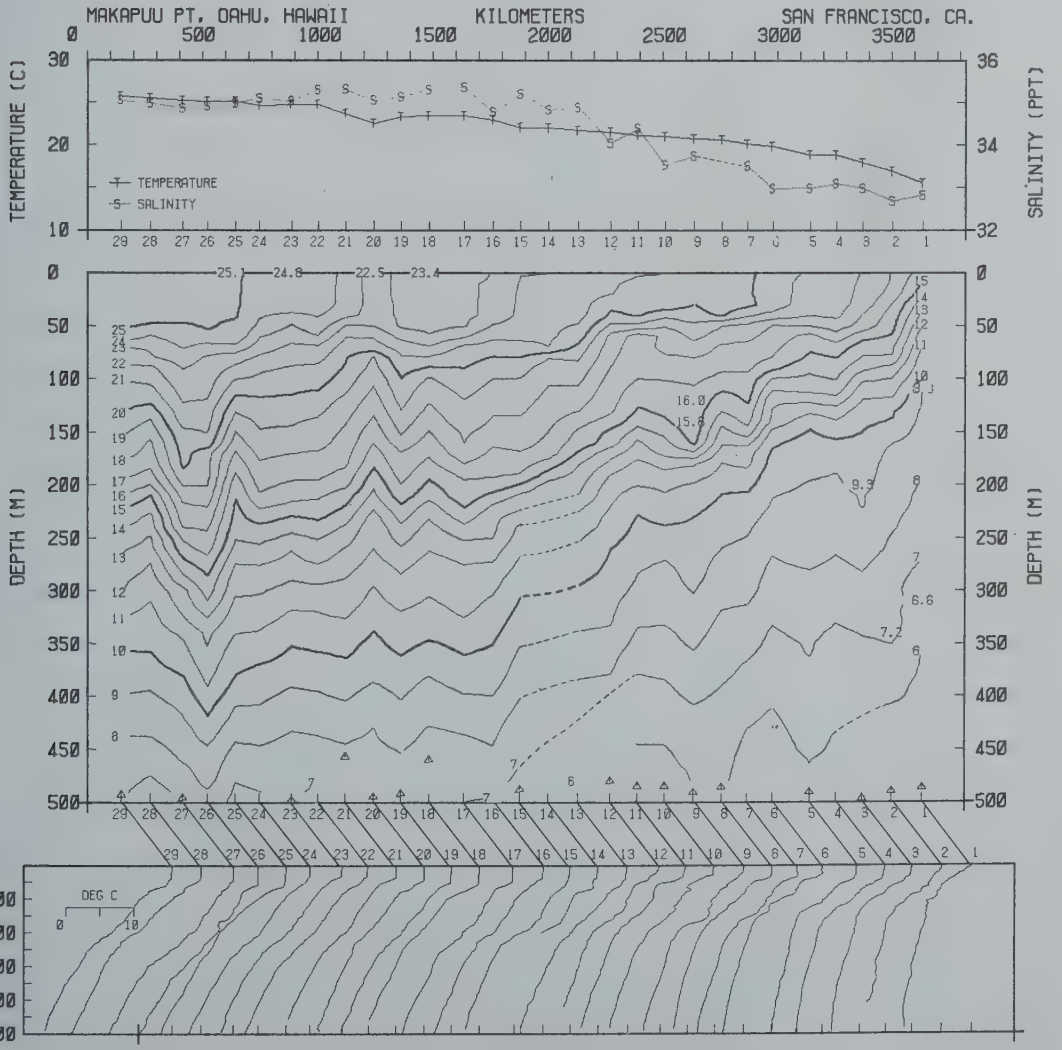

SEPTEMBER 1-30, 1978
FIG.9- SEA SURFACE TEMPERATURE DEPARTURES FROM NORMAL FOR SEPTEMBER 1978 CONTOURS – 1°C INTERVALS LINES DASHED WHERE DATA SPARSE.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
Guayaquil
San Francisco
Esmeraldas
Salaverry
Trujillo
Pisco
Chala
Mollendo
Arica
Iquique
Antofagasta
Valparaiso
Concepcion
Talcahuano
Corral
Puerto Montt
Chiloe I.
Juan Fernandez Is.
Easter I.
Galapagos Is.
Cocos I.
Clipperton I.
Marquesas Is.
Tuamotu Archipelago
Tubuai Is.
Austral Is.
Society Is.
Cook Is.
Samoa Is.
Tonga Is.
Fiji Is.
Kermadec Is.
Norfolk I.
New Caledonia
Loyalty Is.
New Hebrides
Solomon Is.
Bismarck Archipelago
Caroline Is.
Marshall Is.
Gilbert Is.
Phoenix Is.
Line Is.
Hawaiian Is.
Revillagigedo Is.
Guadalupe I.
Socorro I.
Clarion I.
Tres Marias Is.
Islas Marias
Mazatlan
San Blas
Corrientes
Acapulco
Salina Cruz
Champerico
San Jose
Corinto
Manzanillo
Colima
Puerto Vallarta
Guaymas
Alamos
Cabo San Lucas
Gulf of California
Gulf of Tehuantepec
Yucatan
Belize
Honduras
Cuba
Jamaica
Haiti
Puerto Rico
Trinidad
Curacao
Aruba
Maracaibo
Cartagena
Barranquilla
Buenaventura
Tumaco
Callao
Chimbote
Paita
Talara
Isla Gorgona
Isla Malpelo
Isla de Cocos
Isla Coiba
Isla Taboga
Isla Perlas
Isla Rey
Isla Cebaco
Isla Montuosa
Isla Jicaron
Isla Secas
Isla Coiba
Isla Caldera
Isla Chatham
Isla Pinzon
Isla Santa Cruz
Isla Santa Fe
Isla San Cristobal
Isla Floreana
Isla Isabela
Isla Fernandina
Isla Santiago
Isla Rabida
Isla Pinta
Isla Marchena
Isla Genovesa
Isla Wolf
Isla Darwin
Isla Roca Redonda
Isla Roca Partida
Isla Roca Redonda
Isla Roca Partida
Isla Roca Redonda
Isla Roca Partida

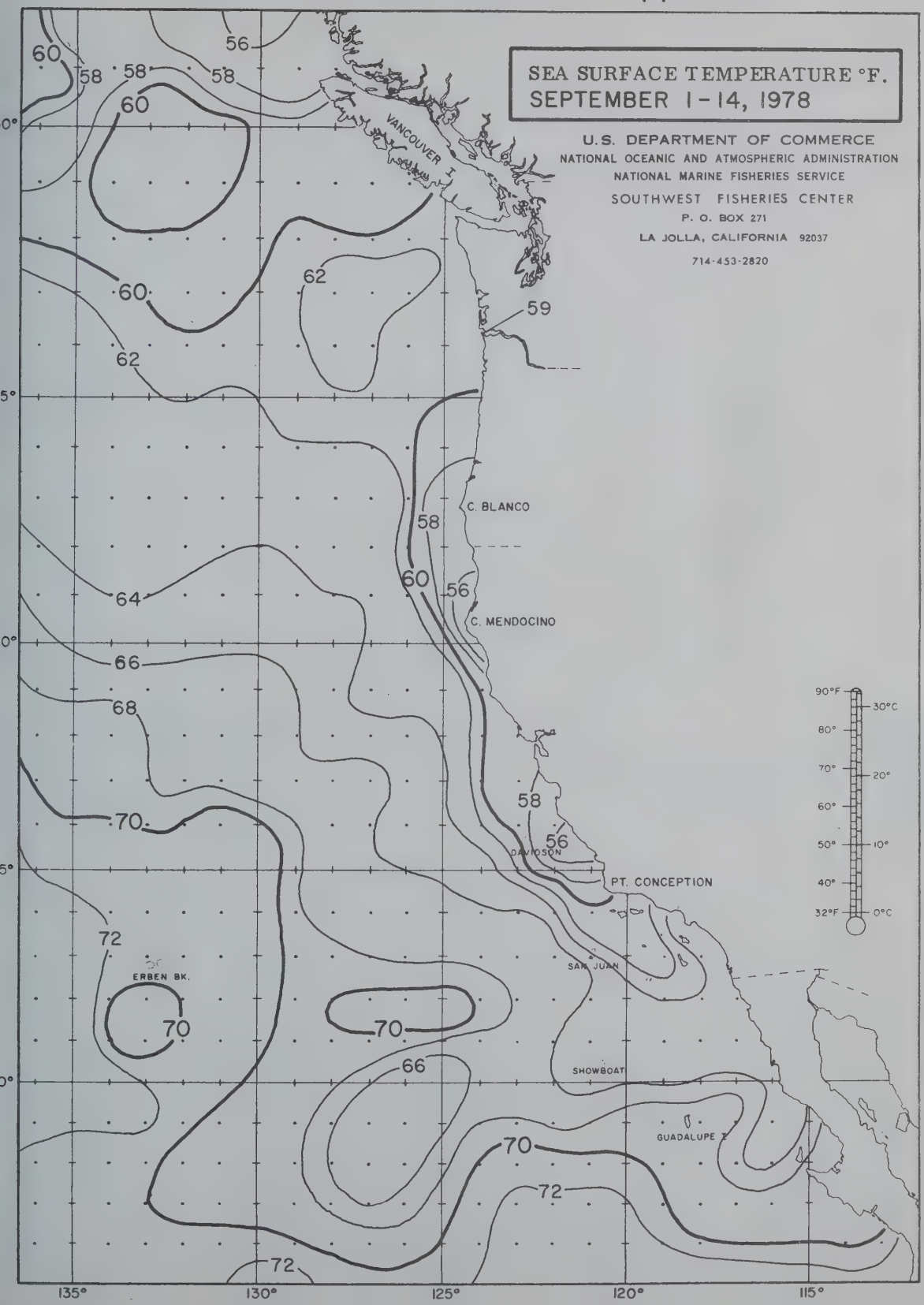
FIGURE 10



SHIP CHEVRON MISSISSIPPI
VOYAGE 286
CHEVRON
SAN FRANCISCO, CA.
- MAKAPUU PT, OAHU, HAWAII
22 AUG 1978 - 28 AUG 1978
NOAA-NMFS PEG MONTEREY, CA.



FISHING INFORMATION – supplement

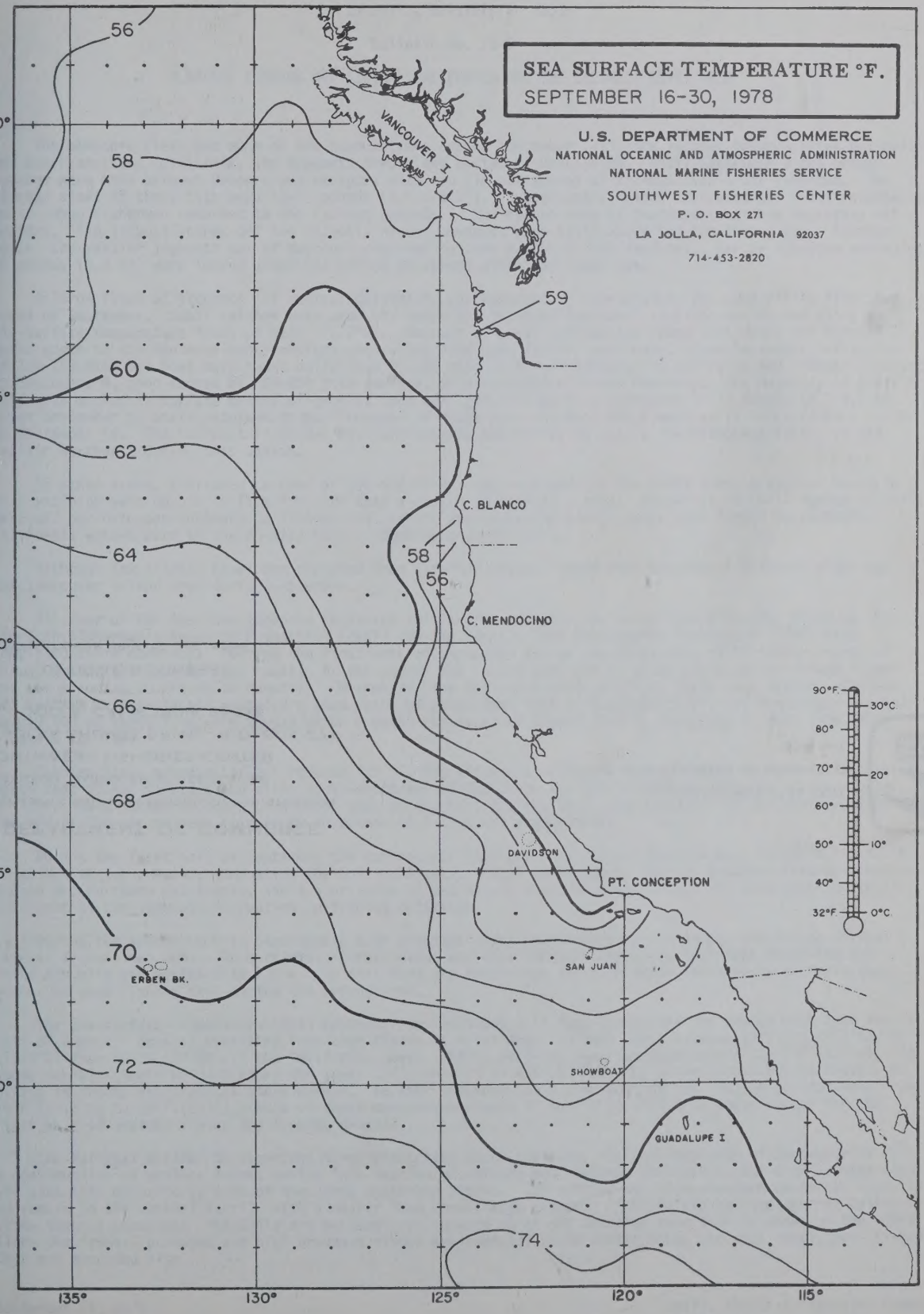


DEPARTMENT OF COMMERCE
OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
OUTHWEST FISHERIES CENTER
JOLLA SHORES DRIVE - P. O. BOX 271
LA JOLLA, CALIFORNIA 92038

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
U. S DEPARTMENT OF COMMERCE
COM-210

FISHING INFORMATION – supplement



DEPARTMENT OF COMMERCE
L OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
A JOLLA SHORES DRIVE - P. O. BOX 271
LA JOLLA, CALIFORNIA 92038

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
U. S. DEPARTMENT OF COMMERCE
COM-210

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92038

Bulletin No. 78-6

ALBACORE FISHING OFF CENTRAL CALIFORNIA AND THE COLUMBIA RIVER AREA

The albacore fleet and much of the good catches during September 1-13 were located between Point Conception and San Francisco, California, and Newport, Oregon and Westport, Washington. Until September 7 the better catches were made between Newport and Westport with top jigboat scores of 250-600 fish a day reported. The average sizes of these fish were 10-12 pounds (4.5-5.5 kg). Subsequently, winds increased and boats returned to port. When fishermen returned to the fishing grounds in the second week of September, catches decreased off Newport. Top jigboat scores off the Columbia River, however, were still about 100-200 fish a day. Farther north, the smaller jigboats out of Westport reported catches of 35-70 fish/day/boat. Larger albacore averaging 15 pounds (6.8 kg) were landed after the period of strong winds and rough seas.

A large fleet of jigboats off central California was hampered by poor weather for much of the first two weeks of September. Small catches were made off Morro Bay in early September as fishermen worked along a sea-surface temperature front of 62°F (16.7°C). Because of small catches and rough seas boats off Morro Bay moved north to the Monterey-San Francisco area where some good catches were made. From September 5-7 scores of 100-150 fish per boat were heard daily from 40-120 miles offshore Monterey to the Guide and Pioneer Seamounts. On September 8, good scores of 500-800 fish per boat were recorded offshore Monterey. The majority of boats in this area worked in surface waters of greater than 61°F (16.1°C) on fish averaging 10-12 pounds (4.5-5.5 kg). After September 8, boats returned to port because of rough seas and many boats were still in California ports on September 14. The baitboat fleet was also off central California as only a few baitboats fished in the Pacific Northwest during this season.

In other areas, scattered catches of 100-500 fish a day were made in the Point Arena area, but boats in this vicinity were unable to fish for more than a couple of days at a time. Meanwhile, a small number of boats were off northern and southern California and fishing was generally poor. Boats that fished in southern California waters were in the 60-Mile Bank - "dumping grounds" area.

Although few catches have been reported from Canadian waters, there were reports of albacore sightings in the Vancouver Island area during September.

All four of the American jigboats chartered to fish for albacore in the northwest Pacific Ocean by the American Fishermen's Research Foundation (AFRF) and the Pacific Tuna Development Foundation (PTDF) have completed their contracts. During the first week of September two of the boats were still fishing north of Midway Island but catches were small. At the end of the second week one of these boats was in Midway Island and was planning to return to Honolulu. Meanwhile, the AFRF-chartered baitboat, Linda, was tagging albacore off central California and reported a good catch of about 1000 fish on September 8 west of Monterey. Approximately 500 of these fish were tagged which brought the total of tagged fish by the Linda to more than 1600 albacore for 1978.

The San Diego sportboat fleet reduced its fishing efforts on albacore during the first half of September. Boats that fished worked 60-90 miles south-southwest of San Diego and catches were mostly one fish/passenger or less. Many larger albacore of greater than 30 pounds (13.6 kg) were caught earlier in the month, but by the end of the second week fish of 20-30 pounds (9.1-13.6 kg) predominated.

During the first half of September the subtropical high pressure center remained west of 140°W and south of 40°N with low pressure dominating the Gulf of Alaska. There were several frontal passages into Washington, Oregon and northern California, and two or three of the heaviest storms moved across the west coast north of 40°N causing considerable disruption in fishing activity.

During the second week in September a high pressure ridge developed over Washington and Oregon following several frontal passages. As a result, surface winds and seas increased offshore from Cape Mendocino and Point Arguello and westward to 130°W. In this area the rough seas and high winds appeared to decrease the number of good fishing days during the second week.

The sea surface temperature (SST) pattern from September 1-14 (see chart) did not change much from the last half of August. Coastal upwelling from Cape Blanco to Point Arguello kept SST's between 55°F (12.8°C) and 60°F (15.6°C) from 60 to 120 NM off the California coast. SST's north of San Francisco were 1° to 2°F (0.6°-1.1°C) above normal. South of 37°N along the coast SST's were 2° to 4°F (1.1°-2.2°C) below normal due to heavy wind mixing in fronts and tropical storm NORMAN. Farther offshore SST's over most of the fishing grounds were from 60°F (15.6°C) to 68°F (20°C). Most of these temperatures were 1° to 2°F (0.6°-1.1°C) above normal for the first half of September over the fishing grounds.

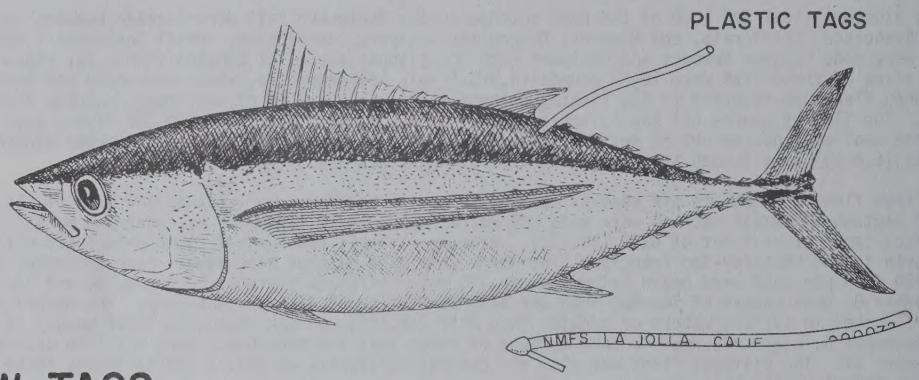
The National Weather Service Long Range Prediction Group's outlook for the remainder of September is for a continuation of weather fronts moving into Washington, Oregon and northern California, but with lighter winds and seas than occurred in some of the early September storms. The subtropical high pressure center is expected to remain in the central Pacific with a weaker than normal high pressure ridge extending into central California after frontal passages. The SST's are not expected to warm up at any location more than is shown on the chart. Since the frontal passages and high pressure ridges are expected to be weaker along the west coast, more fishable days are expected also.

September 14, 1978

Staff, Albacore Fisheries Program
R. Michael Laurs, Leader

$ REWARD $

FOR ALBACORE TUNA TAGS



YELLOW TAGS

THE NATIONAL MARINE FISHERIES SERVICE WILL PAY $ 2.00 FOR EACH YELLOW TAG RECOVERED. (NO NEED TO RETURN FISH)

RECORD:

- ▶ WHERE
- ▶ WHEN
- ▶ HOW

} *FISH WAS CAUGHT*

- ▶ LENGTH OF FISH (TIP OF LOWER JAW TO FORK OF TAIL)

FORWARD TO NMFS ADDRESS ON TAG

RED TAGS

THE NATIONAL MARINE FISHERIES SERVICE WILL PAY $ 50.00 FOR EACH RED TAG & FISH RETURNED. (FISH WITH TAG INTACT MUST BE RETURNED

RECORD:

- ▶ WHERE
- ▶ WHEN
- ▶ HOW

} *FISH WAS CAUGHT*

- ▶ LENGTH OF FISH (TIP OF LOWER JAW TO FORK OF TAIL)

NOTIFY NMFS P.O. BOX 271, LA JOLLA, CA. TEL. (714) 453-2820

THE AMERICAN FISHERMEN'S RESEARCH FOUNDATION WILL AWARD CASH PRIZES FOR YELLOW & RED TAG NUMBERS DRAWN IN AN ANNUAL LOTTERY.